Aim: To assess the feasibility and effectiveness of a laparoscopic virtual reality home simulation training programme (LHSTP) for core surgical trainees.
Methods: 20 Core Surgical trainees were recruited to the LHSTP trial. Baseline laparoscopic skills were assessed using Simbionix (TM) LAP Mentor. 10 trainees received additional training on a portable virtual reality laparoscopic trainer using MySimendo (TM) Laparoscopy online Curricula (MySim group). 6 trainees received no additional training (control group). All recruited trainees then repeated the baseline assessment. In addition, MySim trainees completed pre and post programme questionnaires. Throughout the trial period, both groups had access to a LAP Simendo VR simulator between the hours of 9-17:00 at the regional simulation training centre (RSTC).
Results: All MySim trainees, post-LHSTP, reported improved confidence in "use of instruments" ($p=0.001$), "tissue handling" ($p=0.009$), "manual dexterity" ($p=0.01$), "3-D visuo-spatial awareness" ($p=0.003$) and "depth perception" ($p=0.022$). All recruited trainees improved their assessed baseline laparoscopic skills. No trainees accessed the available LAP Simendos at the RSTC during the trial period.
Conclusion: The LHSTP is a feasible and effective approach to core laparoscopic skills training. It proved highly popular with trainees and allows them to access training outwith their time restricted training schedule.

ASIT ORAL POSTER: 0313: MINIMALLY INVASIVE SURGERY TRAINING USING MULTIPLE PORT-SITES TO IMPROVE PERFORMANCE

Alan White [1,2], Oscar Giles [1,2], Rebekah Sutherland [1,2], Oliver Ziff [1,2], Mark Mon-Williams [1,2], Richard Wilkie [1,2], J.P.A. Lodge [1,2]. [1] *Institute of Psychological Sciences, University of Leeds, Leeds, UK;* [2] *Department of Hepatobiliary and Transplant Surgery, St James's University Hospital, Leeds, UK.*
Background: Structural learning theory suggests that experiencing motor task variation enables the CNS to extract general rules regarding tasks with a similar structure which can be applied to novel situations. MIS requires different port sites but switching ports alters the limb movements required to produce the same control of the instrument. The purpose of this study was to determine if structural learning theory can be applied to MIS.
Methods: A tablet laptop running bespoke software was placed within a laparoscopic box trainer and connected to a monitor. Participants used a laparoscopic grasper to track a moving dot on the screen. There were 2 training groups: the M-group ($n = 10$) who trained using multiple port-sites, and the S-group ($n = 10$) who trained using a single port-site. A novel port-site was used at. Performance metrics included: SACF (measure of speed and accuracy) and NJ (normalised jerk - measure of movement 'smoothness').
Results: The M-group showed a statistically significant performance advantage over the S-group at test as indexed by improved SACF ($p<0.05$) and NJ ($p<0.05$)
Conclusions: There are potential benefits of incorporating a structural learning approach within MIS training. This may have applications when training surgeons and developing surgical simulation devices.

ASIT ORAL POSTER: 0358: STRATEGIES FOR INHIBITION OF CHEMOKINE (CCL2) MEDIATED MONOCYTE MIGRATION

Mahsa Saleki, John Dark, Simi Ali. *University of Newcastle, Newcastle, UK.*
CCL2 mediated monocyte migration has been shown to play an integral role in the pathogenesis of lethal reperfusion injury (LRI) following cardiopulmonary bypass operations, and is associated with 10% post-operative mortality and 25% morbidity.
Study Aim: In vitro analysis of synthetic CCL2 inhibitors (C1-C5) and GAG binding peptides (P1-5) in inhibiting CCL2 mediated monocyte migration, as potential therapeutics for the treatment of LRI.
Methods and Results: Chemotaxis assays were used to screen the potency of all compounds and peptides on CCL2 mediated monocyte migration. The most potent were further analysed using activated trans-endothelial chemotaxis (in vitro model of inflamed capillary wall). P1-5, C1 and C5 showed the most inhibition.
The inhibitory effects of 50μM of C5 on monocyte adhesion to VCAM-1 under flow and sheer stress conditions was analysed using the Cellix system, showing statistically significant reductions ($p<0.05$) in adhesion. Western blotting showed no inhibitory effects of C1 or C5 on CCL2 mediated intracellular expression of p-ERK1/2.
Conclusion: In vitro analysis of synthetic CCL2 inhibitors and GAG binding peptides has shown these strategies to be effective in blocking CCL2 mediated monocyte migration. Further studies to define the mechanism of action of these compounds will aid their development as anti-LRI therapeutics.

ASIT ORAL POSTER: 0450: SURGICAL LOGBOOK COMPETENCE, ARE WE KIDDING OURSELVES?

Toby Pring, Benjamin Stubbs, Jawad Yahya, Richard Cohen, Alistair Windsor, Alec Engledow. *UCH, London, UK.*
Aim: Surgical logbooks form an important part of objective evidence for proving competency and can affect career progression. The electronic logbook allows trainees to indicate their level of involvement for each procedure. There is, however, little formal training on how to code levels of supervision, which may lead to discrepancies between trainees.
Methods: An email survey was sent to all ASIT members listed in the 2010 yearbook, investigating training on logbook completion and to check understanding of various levels of supervision using example scenarios.
Results: 197 responses were received. 20% were CT1-3, 70% ST3-8 and 10% were post CCT. 91% had received no formal training in completion of the surgical logbook. Whilst in some scenarios there was concordance in others there was discrepancy as to level of supervision, with up to 25% of responders misclassifying levels of supervision. Overall, the feeling was that for an operation to be classified as "supervised trainer scrubbed" the trainee had to have performed over 50% of the operation.
Discussion/Conclusions: There is little formal training on how to complete the surgical logbook and there are inconsistencies when coding level of supervision. The level of supervision that responders felt was appropriate to consider a level of "supervised trainer scrubbed" was less than the 30/70 split recommended in the elogbook guidance.

ASIT ORAL POSTER: 0607: A NOVEL HYBRID MINIMALLY INVASIVE TREATMENT OF RECURRENT SUPERFICIAL VENOUS INSUFFICIENCY: A ONE-YEAR PROSPECTIVE CASE SERIES

Sandip Nandhra, Joseph El-Sheikha, Daniel Carradice, Ian Chetter. *Hull-York Medical School, Hull, East Yorkshire, UK.*
Introduction: Recurrent superficial venous-insufficiency (SVI) rates in those previously treated with open surgery remains high. This prospective case-series aimed to establish the efficacy of an alternative novel hybrid minimally invasive treatment.
Methods: Patients with recurrent symptomatic SVI (C2-4) following previous open surgery were assessed and found to have neovascularisation (NV) in continuity with an incompetent anterior saphenous vein (ASV) and/or GSV. All were listed for neo-hybrid treatment by duplex guided EVLA-catheter directed 3% Sodium Tetradecyl-Sulphate foam (FS) delivery to NV and ASV and/or GSV EVLA ablation.
Results: 46 patients aged 52 years (IQR 38 - 60) with C2-4 recurrent SVI were treated; 16were lost-to-follow-up at one-year. One-year duplex demonstrated; 1 case of NV, 1 of recanulation, 7 cases of residual below puncture reflux and 1 above-knee residual reflux. Complications included four self-limiting episodes of phlebitis and paraesthesia.
Treatment satisfaction was high at 12 (10/10; IQR 10-9) and 52 weeks (10/10; IQR 10-6). AVVQ and EQ5D analysis showed improvement from baseline to one year; AVVQ 14.56 to 3.25 (p-0.000); EQ5D 0.796 to 1 (p-value 0.013).
Conclusion: A hybrid-EV procedure is an efficacious approach for the treatment of SVI recurrence; with few complications, rapid recovery and improvements in quality of life.

ASIT ORAL POSTER: 0619: HUMAN ENDOTHELIAL PROGENITOR CELLS (EPCS) INCORPORATE INTO DERMAL SUBSTITUTES AND FORM A THREE-DIMENSIONAL MICROVASCULAR NETWORK

Sandra E. McAllister [2], James Bojdo [1], Christina O'Neill [1], Emma Reid [1], Jasenka Guduric-Fuchs [1], Reinhold Medina [1], Alan W. Stitt [1]. [1] *Queen's University, Belfast, UK;* [2] *Northern Ireland Plastic & Maxillofacial Service, The Ulster Hospital, Dundonald, Belfast, UK.*
Burn injury may be life-threatening; consequent scars have important functional and aesthetic implications. Various biological or synthetic dermal substitutes (DS) may be used before skin grafting, to improve scarring by reconstructing the native dermis. Vascular growth into DS can

be slow, yet timely development of an adequate vascular supply is critical for skin graft revascularisation ("take").
Endothelial progenitor cells (EPCs) are stem cells which can be isolated from various sources, and have great potential as a cellular therapy for promoting vascular repair. This pilot study aims to develop a method to enhance wound healing by prefabricating microvascular networks in DS, prior to applying the construct to the wound.
Two clinically-available dermal substitutes were studied: Glyaderm and Matriderm. EPCs were isolated from adult peripheral blood and umbilical cord blood. EPCs formed a cobblestone-shaped monolayer in culture and expressed endothelial markers CD105 and CD146, but not haematopoietic markers CD14 and CD45. EPCs possessed high proliferative capacity, demonstrated de novo tubulogenesis capacity, and formed 3D tube-like structures when seeded onto Glyaderm and Matriderm.
These results demonstrate that microvascular networks can be prefabricated in DS, using a patient's own EPCs. Further work will determine if this can improve skin graft take and scar formation.

ASIT ORAL POSTER: 0697: ALSGBI TRAINEE PRIZE WINNER: LAPAROSCOPY ON A SHOESTRING: A RANDOMISED COMPARISON BETWEEN AN INEXPENSIVE HOME-MADE STEREOSCOPIC DIRECT-VISION BOX TRAINER AND A COMMERCIAL MONOSCOPIC VIDEO-BASED TRAINER

Vin Shen Ban [1], Matthew Bence [1], Matthew Bigwood [1], James Clemence [1], Aaron D'Sa [1], Daniel Carroll [2], Maurizio Pacilli [2]. [1] *Cambridge University Hospitals, Cambridge, UK;* [2] *Paediatric Surgery Unit, Cambridge University Hospitals, Cambridge, UK.*

Aims: Our aim was to develop and assess the laparoscopic training performance of an inexpensive home-made stereoscopic direct-vision box trainer (SDVT) against a commercial monoscopic video-based trainer (MVT).
Methods: 41 laparoscopic-naïve medical students were randomly assigned to one of four training-testing groups - SDVT-SDVT, SDVT-MVT, MVT-SDVT, MVT-MVT. For 5 consecutive days, each student trained on either the SDVT or MVT and was tested immediately after training on either trainer. The two time-limited tasks involved were 'threading Polo mints' and 'peg board bead transfer'. The number of 'successes' and 'errors' were recorded.
Results: Average 'successes' for both tasks increased linearly daily. The SDVT-SDVT and MVT-SDVT groups had more 'successes' compared to SDVT-MVT and MVT-MVT. 'Errors' were random without correlation to training or groups.
When results were grouped by 'testing' box, those tested on the SDVT had significantly more successes than those tested on the MVT ($p<0.05$). Grouping by 'training' box showed no such difference ($p>0.3$).
Conclusions: SDVT training produced similar results to MVT training. The SDVT is a much cheaper alternative to the MVT. Using stereoscopy through direct vision flattens the learning curve for beginners. This could enable trainees to build confidence and skills in their own time at minimal cost.

ASIT ORAL POSTER: 0722: DOES DISTRACTION AFFECT THE LAPAROSCOPIC ABILITY OF NOVICE SURGEONS?

David Neilly [1], Duncan Scrimgeour [1], Tim McAdam [1], Steven Yule [2]. [1] *Aberdeen Royal Infirmary, NHS Grampian, UK;* [2] *Harvard Medical School, Boston, USA.*

Aims: Laparoscopic surgeons perform complex tasks in a challenging, multifaceted environment. We investigated if distraction affects the novice surgeon's ability to perform a laparoscopic task.
Methods: Medical students were recruited through the local student surgical society. The students were randomised into three groups: without distraction ($n=16$), distraction with a pre-recorded clinical discussion ($n=14$) and distraction with a pre-recorded loud argument ($n=16$). After a five-minute practice session each student performed a laparoscopic stacking task using a laparoscopic simulator within three minutes to achieve a score out of twenty. Statistical analysis using analysis of variances (ANOVA) with post hoc tests and two-tailed unpaired t-tests were performed when appropriate.
Results: Forty-six medical students were enrolled in the study. The mean score achieved was 12.96. Distraction with a clinical discussion significantly reduced the mean score (14.88 vs. 11.29,$p<0.01$), but distraction with a loud argument had no effect (14.88 vs. 12.55,$p=0.15$).
Conclusions: Distraction in the form of a clinical discussion negatively influences the novice surgeon's laparoscopic ability but loud arguments do not. This should be taken into account for training in the theatre environment, especially for the novice surgeon.

ASIT ORAL POSTER: 0802: IMPACT OF LOW PRESSURE LAPAROSCOPIC CHOLECYSTECTOMY ON HEPATIC FUNCTIONS

Sham Singla. *Post Graduate Institute of Medical Sciences, Rohtak, India.*

Introduction: Pneumoperitoneum during laparoscopic cholecystectomy produces adverse hemodynamic and hepatic changes. To lower these undesirable effects, low pressure pneumoperitoneum (LPP) has been used.
Aim: To assess changes in liver function tests with LPP and compare these with Standard pressure pneumoperitoneum.
Material and Methods: A prospective randomized study, approved by the IEC, conducted at PGIMS, Rohtak from June 2010 to June 2011. Fifty patients, randomized into 2 group- Standard pressure group (SPG, 12-14mmHg) and Low pressure group (LPG 10mm Hg). The LFTs were done preoperatively, postoperative day 1(POD-1) and 7(POD-7). Chi-square and t-test were used for statistical analysis.
Results: The duration of surgery was 69 min in SPG and 72 min in LPG. There was a statistically significant difference in values of serum bilirubin, AST, ALT, PTI and INR on POD 1 when LPG was compared to SPG. Values of ALT, PTI and INR were still persistently higher on POD-7 in SPG and this difference was statistically significant when compared to LPG.
Conclusion: LPP reduces the intensity of hepatic enzyme derangement which may be useful in jaundiced patients undergoing laparoscopic surgery.

ASIT ORAL POSTER: 0852: THERMOGRAPHIC STUDY OF SACRAL PERFORATOR ANATOMY

Toby Jennison, Yezen Sheena, Joseph Hardwicke, Garth Titley. *Queen Elizabeth Hospital, Birmingham, UK.*

Aims: Perforators are arteries that supply the subcutaneous tissues and skin. The sacral area is a region with notoriously poor wound healing and conditions such as pilonidal sinuses and chronic pressure sores are difficult to treat. There are limited studies of the perforator anatomy in the sacral region. This study aimed to assess this to better understand the local vascular anatomy underlying these conditions and their best surgical management.
Methods: 20 healthy male volunteers were scanned using a thermal camera. Each had radii of 2.5cm and 5cm centred on the superior natal cleft marked. Thermographic 'Hot spots' representing perforators were marked and recorded.
Results: In 20 sacral regions thermally imaged there was a mean of 0.3 perforators (range 0-2) within 2.5cm of the natal cleft and a mean of 2.3 perforators within 5cm (range 0-6). 4 of the 20 participants had no perforators within 5cm of the natal cleft
Discussion: This study found few perforators within 5cm of the superior natal cleft. This limited perforator supply may account for the wound healing difficulties encountered in this region and the challenges reconstructive surgeons face in their management.

ASIT ORAL POSTER: 0899: PUTATIVE GENES DOWNSTREAM OF FGFR2 CONTRIBUTING TO CORONAL CRANIOSYNOSTOSIS IN A CROUZON MOUSE MODEL

Samintharaj Kumar [1], Emma Peskett [1], Jonathan A. Britto [2], Erwin Pauws [1]. [1] *UCL Institute of Child Health, London, UK;* [2] *Great Ormond Street Hospital, London, UK.*

Aim: One fifth of patients with craniosynostosis have a genetic diagnosis, many of which carry a causative mutation in an FGFR gene. Little is known about downstream molecular pathways, impeding the development of potential pharmaco-therapies.
The activating C342Y mutation in FGFR2-IIIc drives coronal synostosis observed in Crouzon syndrome. In a Crouzon mouse model, morphological differences between control wild-type (Wt) and $Fgfr2^{C342Y/+}$ (Mut) calvaria were found after E17.5 suggesting enrichment for genes causing coronal suture fusion.
Methods: Coronal sutures were micro-dissected from Wt/Mut mouse calvaria, and examined by microarray analysis for differences in gene expression profile.